ABSTRACT OF THE DISCLOSURE

This is a new process for inducing pulmonary hypertension (elevated blood pressure in the pulmonary arteries) in animals, with the objective of identifying and/or eliminating susceptible individuals or families to achieve genetic improvement in agriculturally important breeds of poultry (broiler chickens and turkeys), and cattle. The invention also will be useful for animal research directed toward understanding pulmonary hypertension and its sequelae in human patients as well as in animals. Sustained pulmonary hypertension leads to pulmonary hypertension syndrome, which adversely impacts poultry production throughout the world, as well as cattle production when cattle are kept at latitudes sufficiently high to challenge blood oxygenation. In poultry, the pathosphysiological progression of pulmonary hypertension syndrome leads to terminal ascites (fluid accumulation in the abdominal cavity) followed by death of the animal.

The basis of the invention is the novel concept that particulate substances of a size (approximately 8 to 250μm diameter) suitable for occluding the blood vessels in the lungs (pulmonary vasculature) can be suspended in an appropriate carrier vehicle, and the suspension then can be injected intravenously. The venous blood then carries the particles to the right ventricle of the heart, which in turn pumps the blood containing the particles to the lungs. In the lungs, the particles directly increase pulmonary vascular resistance by lodging in small blood vessels, thereby partially blocking blood flow. Proportional or variable occlusion of the pulmonary vasculature can be accomplished by adjusting the number of particles administered. By increasing the resistance to pulmonary blood flow, the right ventricle of the heart is forced to develop and maintain an elevated pressure in the pulmonary arteries (pulmonary hypertension) to propel the requisite cardiac output through the vessels remaining unoccluded. Animals that are susceptible to pulmonary hypertension

subsequently will develop pulmonary hypertension syndrome. Animals that are resistant to pulmonary hypertension will not develop pulmonary hypertension syndrome. The resistant animals or their pedigreed families can be selected for breeding genetic stocks.